





THE ISLE OF PINES:

(CARIBBEAN SEA)

ITS

SITUATION, PHYSICAL FEATURES, INHABITANTS,
RESOURCES, AND INDUSTRIES.

WITH MAPS.

PREPARED IN THE DIVISION OF INSULAR AFFAIRS,

WAR DEPARTMENT,

1902.

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W B Randolph Keim
Editor



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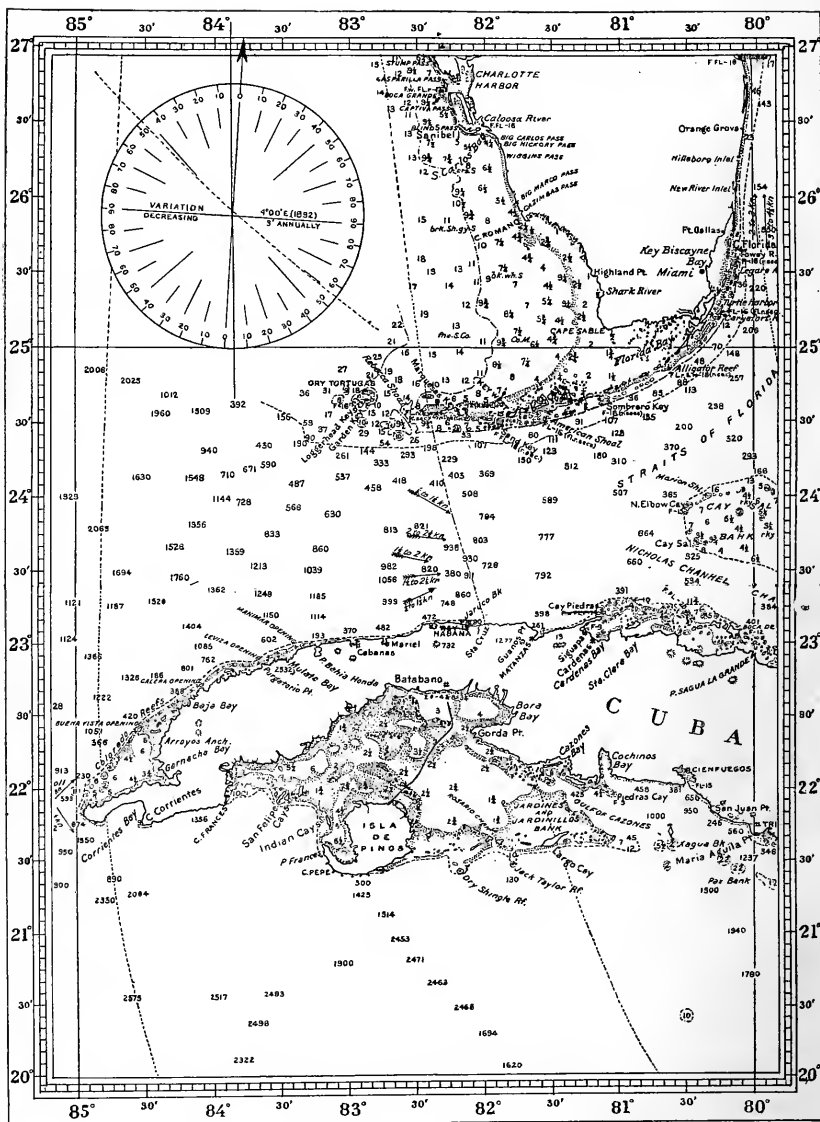
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ISLE OF PINES—SURROUNDING WATERS AND MAINLAND.

THE ISLE OF PINES.

[SEE MAP.]

[" * * * That the Isle of Pines shall be omitted from the proposed constitutional boundaries of Cuba, the title thereto being left to future adjustment by Treaty."—*Act of Congress U. S., approved March 2, 1901.*]

CAPITAL, Nueva Gerona; latitude $21^{\circ} 57' N.$, longitude $82^{\circ} 40' W.$ (approx.).

AREA, 986 square miles.

POPULATION, United States Census of 1899, 3,199; Spanish census of 1887, 1,992.

RACE, Spanish and colored.

LANGUAGE, Spanish.

UNITED STATES MILITARY DEPARTMENT OF CUBA, Headquarters, Habana.

TABLE OF DISTANCES.

From Nueva Gerona—	Statute miles.
To Batabano, NNE.....	65
To Habana, N. by E., via Batabano.....	90
To Miami, Fla., via Habana	238
To New Orleans via Batabano and Habana	810
To New Orleans by sea	828
To Pensacola, Fla., via Batabano and Habana.....	713
To Pensacola by sea	783
To Tampa, Fla., via Batabano and Habana.....	350

LOCATION AND BOUNDARIES.

The Isle of Pines, also called Reina Amalia, lies in a deep bight off the south coast of the western part of Cuba, between latitude $21^{\circ} 24' 40''$ and $21^{\circ} 56' N.$, and longitude $82^{\circ} 30'$ and $83^{\circ} 12' W.$ Its extreme northwest point (de los Barcos) is 30 nautical or $34\frac{1}{2}$ statute miles southeast of Punta de Carraguao (Pinar del Rio), the nearest land of Cuba. Its surrounding waters are the Caribbean Sea.

The island lies 730 miles (statute), across the Caribbean Sea, north of Greytown entrance to the Nicaragua canal; 850 miles north by west of Colon entrance to the Panama canal; 230 miles east of the nearest coast of Yucatan, Mexico, and 370 miles northwest of Jamaica. It is protected from approach on the north by the coast of Cuba and from all sides on the Caribbean Sea by the shallow channels and innumerable keys which can be easily

mined. The island, in a defensible point of view, can be made impregnable at a minimum outlay.

The Cuban provincial name of the island is "Quitrin," on account of the resemblance of its outline to the body of a chaise (volante).

AREA.

It is 34 miles from north to south and 43 miles from east to west on a line with Point Frances. Its area is 986 square miles, or 631,040 acres, including the Cienaga, but 99 square miles less than the land superficies of the State of Rhode Island, and within 264 square miles of its total of land and water. It is nearly equal in size to the combined area of the 1,360 other isles, islets, and keys which encircle Cuba. According to the "Derrotero de las Antillas" the island [its arable portions] is a square of 30 miles if a narrow tongue which runs from its southwest corner 11 miles to the northwest is not considered. The greatest length is from northeast to southwest, 43 miles, and breadth at the center from east to west 32 miles, and in the south 43 miles.

PHYSICAL FEATURES.

The island has a geological relation to the general chain of insular mainlands of the Antilles, and is unlike the numerous low coral and sand formations known as keys and mangrove swamps scattered in such profusion off the coast. In general the surface is a plateau of 50 to 100 feet above sea level, broken by ridges of hills or cliffs that project abruptly above the general surface.

The two mountain ridges at the northern end reach an elevation of about 1,500 feet, and are composed of limestone and marble. The other ridges in the center are much lower, less precipitous, and formed of gray sandstone, red rock and gravel, containing iron.

The most remarkable summits are the Sierra de la Cañada, 1,600 feet high, with precipices 150 feet; Daguila, 1,500 feet high, from the summit of which may be had a view of the entire island; Sierra de Caballos, 1,074 feet high; Mount Casas, about 2 miles from the latter, composed of beautiful marbles of various colors, and Mount Cristales, of moderate height, its sides being covered abundantly with green rock crystals.

The southern part, comprising about one-third of the entire area, is an impassable cienaga or salt bayou and lagoon, interspersed by islets and rocky ledges of locally known "dog-tooth" or coral rock, and occupied by fishermen. There is a small open lake on the south of the causeway, which connects with the higher ground.

A chain of islets from its extreme east point, called the *Islas de Mangles*, extends in a northwesterly direction into the bight, which is filled with a number of small keys. From the southeastern shore at *Piedras Point* another chain of keys extends eastwardly to a point southwest of *Cienfuegos*. North of these lie the *Jardines* and *Jardinillos* banks, a very shallow body of water, so named on account of their verdure-strewn islets, in many of which springs of pure water bubble up from the deep. These banks and keys, extending east and west like curtains from the island and the *cienaga* on the south of the mainland, form an impassable line of defense against attack from the Caribbean Sea.

The whole island, with the exception of the rocky southern coast, is surrounded by mangrove swamps, with here and there a stretch of sandy beach.

The island has a number of rivers of excellent water, the most important of which emptying on the north coast are the *Nuevas*, composed of several mountain tributaries, 5 to 10 feet deep, and navigable 4 or 5 miles; the *Sierra de Casas*, also composed of several mountain branches, near the mouth of which *Nueva Gerona* is situated, and accessible by vessels drawing 5 feet. On the northeast coast is the *Santa Fe*, formed of many streams, on the main one of which, navigable for small craft, the town of the same name is situated. On the east coast is the *Guayabo*. The *cienaga* or swamp on the south receives the mountain drainage through the outlets of nine streams. On the west coast are no streams of importance.

RIVERS AND STREAMS.

The drainage of the island is represented by the following rivers and streams:

BERNARDINO.—A rivulet tributary to the *Santa Fe* on the south.

CALLEJON, RIO DEL.—Near the west coast; rises in the *Sierra San Jose*; flows north by east past *Santa Teresa* and *La Nuevas*. Of the stream of the latter name it is the west tributary.

CASAS RIO DE SIERRA.—Rises in the highlands of the north near *Santa Rosalia*. It flows north, passes *Nueva Gerona*, the capital, to which point it is navigable for the steamer which plies between the island and *Batabano* on the Cuban coast, and enters the sea about the center of the north coast of the island between *Fuera* and *Barcos* points.

CAYAMAS.—A rivulet which, rising east of *Asiento de Santa Fe* and flowing northeast, is lost in the lagoons near the coast south of the mouth of the *Santa Fe*.

CITERNA.—The larger and western of the many tributaries of the Las Nuevas, rising in the Sierra de la Cañada in the southwest of the island.

GRANDE.—A small stream rising south of Sierra Seiba and emptying into the Cienaga on the south.

GUAYABO.—Rises in the vicinity of San Juan on the east, and flowing northeast empties into the sea south of Potrero Point, east coast.

INDIOS, RIO DE LOS.—Rises in the Sierra de la Cañada, flows west past San Antonio, and empties into Siguaneya Bay on its northeast shore southeast of Majagua Point.

ITABO.—A small stream emptying on the east shore of Siguaneya Bay.

JAGUA, RIO DE LA.—Rises on the south watershed of the Sierra de la Seiba, flows southeast into the Cienaga on the east between the Cayo de Piedras and Boca de la Cienaga.

MAL PAIS.—Rises on the east slopes of the same summit as the Nuevas and, flowing northeast, enters the Santa Fe at Jucaro, to which point the main stream is navigable.

MEDIO, RIO DEL.—A tributary of the Rio de las Nuevas, entering that stream on its east shore near its mouth on the north coast.

NUEVAS, RIO DE LAS.—The largest river on the island, rising in the same central summits which feed the Rio Mal Pais, Santa Fe, and Jagua. It receives its larger tributaries, Citerna, Callejon on the west, and Medio on the east, the latter near its mouth on the north coast east of Point de los Barcos.

SAN PEDRO.—Rises in the hills of that name near the southwest center and empties into the Boca de la Cienaga, in the northeast angle of Siguaneya Bay.

SANTA FE.—One of the most important streams but not the largest, with many small tributaries; it rises about the center of the island and, flowing northeast, enters the bight between points Fuera and Potrero. On the main stream is situated the town of the same name and important thermal springs. (See "Thermal Springs.") It is also navigable to Jucaro (see).

SANTIAGO.—Rises between the Cerros del Aji and La Seiba and flows southeast, emptying into the Cienaga on the southeast near the Boca de la Cienaga.

SIGUANEA, RIO DE LA.—Rises on the southern declivities of Sierra de la Cañada and, flowing south, empties into the Cienaga mouth in the northeast angle of Siguaneya bay.

TINAS, ARROYA DE LAS.—A rivulet rising south of hill of del Monte and empties into the Cienaga on the west.

"The Universal Geography," by Elisée Reclus, Volume XVII, referring to the interesting physical characteristics of the island, says:

Manzanillo bay * * * . Farther on, the Isle of Pines is connected with a labyrinth of reefs and islets, of which the best known are those of the Jardines Bank and the Jardinillos, forming a seaward prolongation of the Marsh of Zapata. In the Jardines, so named from verdure-clad islets strewn like "gardens" amid the blue waters, springs of fresh water bubble up from the deep, flowing probably in subterranean galleries from the mainland.

The Isle de Pinos (Pinos Island or Isle of Pines), which lies off the southwest coast of Cuba, is alone more extensive than all the other 1,300 isles and islets strewn around the Cuban seaboard. It consists in reality of two islands separated by a tortuous passage, half channel, half swamp, which winds at nearly uniform width for about 3 miles from west to east. This cienaga, or "marsh," as the Spaniards call it, is a rivière salée (salt river) analogous to that of Guadeloupe.

Toward its eastern extremity a few rocky ledges flush with the water have been utilized to make a camino de piedra (stone causeway) between the two sections of the island. A great contrast is prescribed by these sections; that on the north is diversified with "sierras," groups of hills and isolated eminences, one of the summits in the Sierra de la Cañada rising to a height of 1,540 feet; but the southern section is everywhere low, although the swampy savannas and impassable quagmires are here and there interrupted by sharp rocks, intersected by fissures and pierced by seborucos or pits.

This part of the island seems to have been upheaved in relatively recent times, for even within the historic period islets on the coast have been submerged in continuous land by the mangrove thickets spreading over the intervening straits and shallows.

TOPOGRAPHY AND HYDROGRAPHY.

According to the "Diccionario Enciclopédico Hispano Americano," volume 15, Barcelona, 1894, quoting the "Derrotero de las Antillas"—

The island is divided by a swamp sometimes impassable in its southern portion, which is in general very low and marshy. Its northern portion, which is mountainous and contains many rivers which are navigable for vessels drawing from 8.3 to 9.3 feet, is entirely covered with thick woods, where good pine is found; the inhabitants engage in cattle raising and most of them reside in Nueva Gerona, a small place situated in the northern portion, composed of guano and yagua huts. The island can be distinguished from a distance of 45 miles in the south by three mountains, of which the highest and western one, which belongs to the San Jose Sierra, although having three peaks, appears to be one until its meridian is passed to the west; and, according to the point whence one looks at it, it presents on the northern coast the Sierra de Caballos, which can be seen 30 miles away. In the center is the Sierra de la Cañada and the Sigüanea hill, which, when approaching the west coast, may be seen at a distance of more than 30 miles; and the peak of La Daguilla, nearer the eastern coast. Alejandro Helvecio Lanier, in his "Geography of the Isle of Pines," says that the total area is 614.34 sq. marine miles, or 211,000 hectares (1 hectare=2,471 a.), of which the northern portion occupies 133,000 and the southern 78,000, taking the straits of Cayo de Piedra and the bed of every large creek as dividing points. Its greatest length is from the eastern extremity to French Cape (Frances) 16½ legal

leagues, or $70\frac{3}{8}$ kilometers ($43\frac{1}{2}$ miles), and its greatest width on the meridian $76^{\circ} 1' 2''$, $12\frac{3}{8}$ leagues, or $53\frac{3}{8}$ kilometers (33 miles). Its nearest point to the Island of Cuba is distant $10\frac{1}{4}$ leagues (29 miles) from Barcos Point to the point of the Palacios River in a northwest direction, and $24\frac{1}{2}$ leagues (66.3 miles) from the mouth of the river Sierra de Casas to Batabano.

The northern portion of the island is covered with pine trees, and the ground is to a large extent sandy. Only on the banks of the rivers and around the mountains lands of good quality are to be found, good for the cultivation of anything and the growing of wood of all the species known in Cuba. The southern portion is perfectly level and very little above sea level. It is covered with trees of all kinds, which grow among rugged and sharp stones called "seboricos," which render a passage through these thickets exceedingly difficult and the removal of the many useful woods almost impossible.

The littoral, from the mouth of the Sierra de Casas River to the foot of the Columpo is very low, being at sea level at almost every point. Only near the edge is it about half a yard above. As far as 600 varas (1,666 feet) to the interior, it is continually overflowed, not only because it is at sea level, but because it receives the waters from the plains and from various small creeks. All these low lands are covered with mangrove trees and lianas so dense that they are impassable. The banks of the Sierra de Casas River are also covered with similar trees, especially the western one, as far as the town. The foot of the Columpo is composed entirely of stones and enormous rocks, which appear to have broken away from its summit. From the Columpo to the Punta de Piedra the coast is a stretch of fine white sand, slightly higher than that on the other side of the Columpo and much wider and cleaner. Forty varas (111 feet) from the edge the land gradually descends until it reaches sea level, the greater portion being overflowed. Near the Columpo is situated a forest of high trees containing a number of useful woods. Piedra Cape is composed of rocks, and to the west, at a distance of 442 varas (1,228 feet), is situated the Piedra del Indio, which is likewise a rock. From Piedra Cape, the lands adjoining the coast continue low and marshy. These marshy lands contain various kinds of mangrove trees (mangles, prietos, and patabanes) up to near the mouth of Simon Creek, where there are mangroves "de uña." This creek forms, before emptying into the sea, a large lake and inundates the surrounding land up to near the Bibijagua and the Morrillo. The shore of Los Flamencos is that which follows to the southwest of the Morrillo. It is separated from the leeward coast only by a strip 90 varas (252 feet) wide at its narrowest point. The other two points are formed by the ends of the Bibijagua Sierra. Between them lies a stretch of sand, and 50 varas (138 feet) from the coast the forest at the foot of the sierra begins.

The coast from the Bibijagua Sierra goes in the same direction as the last named, but a little before Salinas Point there is a natural salt deposit 500 varas (1,472 feet) long. From the first to the third Salinas point the land next to the coast for a distance of 25 varas (69 feet) is at sea level, but it forms large, clean, salt pits, without any trees. These natural salt deposits, which it would be easy to work, increase in width to the west, forming large tracts. From here on, these tracts are very large, and from the shores of the Cocodrilos to the mouth of the Santa Fe river the sea connects with them directly, being separated therefrom only by a narrow strip of mangrove trees. The place where these tracts are largest is at Point Fuera.

From the mouth of the Santa Fe River to the Grande Estuary, the entire coast consists of an impenetrable marsh. Thence to the eastern point, it is possible to land only at the Caudal wharf and at the points of Rancho Viejo and Piedra. The mangrove thicket continues still further to the south of the east point and

reaches the point where the shore of the south coast begins, where a small hut is situated built of guano by fishermen. From this point, called the "Rancheria of the East," begins a stretch of sand half a league long which forms a shallow bay. At the end of this sandy stretch begins the stone coast, continuing as far as Seboruco Alto and Brava Point. Here the "Playa Larga" begins, which is composed entirely of sand. At the same point a swamp $\frac{3}{4}$ of a league (2 miles) wide begins, which stops at the head of the Guanal. It is an absolutely impenetrable marsh. The greatest distance between the coast and the swamp is 300 varas (834 feet), and the shortest 80 (240 feet). The elevation of this land above sea level is not more than 3 varas ($8\frac{1}{2}$ feet), as far as the point of Curazao, where the elevation is slightly higher, reaching 8 varas (22 feet) at Canoa Point, and continues at this elevation almost to the head of the Guanal, where it is barely 1 vara (33.384 inches). The water of this swamp is salty and not potable. Pure water can not be found at less than 400 varas (1,111 feet) leeward from Maracayero Point. This swamp contains two estuaries by which it empties into the sea. The principal one is the Siguanaita. The second, which is very small, is located 120 varas ($333\frac{1}{3}$ feet) to the north of Guanal Point. The entire Playa Larga, from Brava to Guanal Point, has a sandy bottom with some stones and 6 feet of water at its lowest depth.

Half a mile south of Curazao Point is situated a bank even with the surface of the water. Eight hundred and fifty varas (236 feet) SSW. from the latter are situated two similar ones and some other lower ones. The rest of the stretch is unobstructed. The reefs and rocks begin at Brava Point, run to the southeast 1 mile as far as the quebrado (opening) of Barlovento, which are covered by 9 feet of water, continue south 700 varas (1,945 feet) and then WSW. as far as Guanal Cape, approaching the coast. In these reefs there are four openings which permit an entry into the Playa Larga. The first, already mentioned, 1 mile south of Brava Point; the second, opposite the Bay of Llimtete; the third, south of Curazao Point, and the fourth, the largest, is that of Guanal Cape, which is nearly 1 mile wide.

From the mouth of Sierra de Casas River to Barcos Point the coast land is low and swampy, almost level with the sea. The trees in this swamp are mangroves, yanas, and patabanes, which extend as far as the water's edge, which is sandy. There are 3 feet of water and a sandy bottom up to 50 yards of the edge. Barcos Point is an impassable mangrove thicket at sea level. At the end of the bay there is a small estuary which connects with the sea north of the point, but it is impossible to traverse it with any vessel unless it is dragged over the mud. This bay is surrounded with swamps. The marshy lands continue very nearly to the Capitan Estuary, where a sandy stretch begins and continues as far as the Pino Estuary, which has two mouths; that of the north 1 foot deep and 40 varas wide, the other SSE. of the latter about 150 varas (416 feet), 3 feet deep, but narrow and hardly visible. On each side of the first estuary are swamps and lakes of salt water, which continue along the banks of the sea as far as Buena Vista Point and thence along the entire edge of the Bay of Siguaná, which begins at this point. The coast from said Buena Vista Point runs southeast to the mouth of the large swamp called Siguaná. Two and one-half miles distant is situated the Soldado Estuary, which is very small and the mouth of which is $\frac{1}{4}$ of a league (0.675 mile) WSW. from the hill of the same name. Majagua Point is $4\frac{1}{2}$ miles from Buena Vista Point.

Along the entire coast of the Bay of Siguaná no river but the Indios empties, which has a very small mouth. Further on we come to French Cape, or the small key called Cayuelo, there being a distance of $3\frac{1}{2}$ miles therefrom to Cocodrilo Point on the bay. The port called Frances (French) consists of the bay which lies between Pedernales Point and the small tongue of land of La

Rancheria. SSW. of this point, 120 varas (133 feet) distant, there is a small key 24 varas (66 feet) from northeast to southwest, and 70 (194 feet) from north to south. Between this small key and the land there is only 1 foot of water. This port has a fair capacity and sufficient water for merchant vessels; but vessels can not anchor at the entrance in 6 fathoms nor inside in 2, because the bottom is composed of large and rugged stones, with deep fissures, where the anchors would be lost. In the middle in 3 fathoms is a good sand and stone anchorage. The port is protected from the southeast, east, and northeast winds, but not from those coming from the third and fourth quadrants. This is one of the reasons which force an anchorage as far out as possible in order to facilitate an easy departure in case of being surprised by the last-named winds. Vessels of small draft may in such case seek refuge behind Cape French, where there are two arms, having a mud bottom, entering the same from the north, which is 8 feet deep.

The bay to the north of the Rancheria is closed on the west by reefs, and the passages in the latter have water sufficient only for small vessels, such as boats and canoes. Between the reefs and the coast there is an innumerable number of rocks beneath the surface of the water which make this region very difficult to navigate even for canoes, for which reason fishermen and guides living there have marked out the channels which lead to the Rancheria Point from this side. The edge of this bay and that of the north of La Vigia Point, as far as Cape Frances, is a sandy stretch. Fifteen varas (42 feet) from the water's edge the land is 3 varas (8 feet) above sea level, and from this point the elevation decreases until the swamp is reached, 120 to 150 varas (333 to 416 feet) distant. The southern beach or bank of La Rancheria or Port Frances is composed of quick-sands and of flat stones at the water's edge, preventing the landing of vessels. At the end of this bank there are some rocks 3 varas (8 feet) high and 9 feet of water next to them with a stone bottom. One hundred varas (28 feet) NNE. of this point is situated a small cove with so little water that it is difficult for canoes even to enter it, the bottom being of stone. From this point to the northwest point of the key which forms Cape Frances, there is a distance of $3\frac{1}{2}$ miles in a straight line in a direction running from southeast 18° . Two and three-fourths miles southeast $29^\circ 1' 2''$ from Pedernales Point, is situated Lugo Point, and $\frac{1}{2}$ mile north the cove of the same name. To the northwest there is a small bay which has a sandy shore, and southeast a high rock which extends to the center of the bay, where there are fishing banks. It has 3 feet of water and a sandy and stone bottom. At the end of the bay, north of Lugo Bay, there is another small bay, Ingles, $1\frac{1}{2}$ miles southeast of Pedernales Point. Two and one-half miles from Lugo Point is situated the Grande Bay; then follow the Caletones, Cocodrilo points and the bay of the same name. From French Cape to Cocodrilos, Carey fishing is very good. Then follows Infierno Bay, north of which is a large lake; Jorobado Bay, where two creeks empty; Diablo Bay, 3 miles from the latter; Purgatorio and Carapachivey bays, the largest of all on the southern side of the Island, with a mouth more than $\frac{1}{4}$ league (0.6479 mile). Finally, we come to Agustin Fol Bay. There is a distance of 4 miles from this bay to the head of the Guanah.

The mountains of the Isle of Pines, by order of elevation, are: Cañada, Daguilla, Caballos, Sierra Casas del Sur, Sierra Casas del Norte, San Pedro, del Monte, de la Seiba, Lacunagua, Mal Pais, Aji, La Manigua, San Jose (last hill in the south), Sierra Pequeña, Columpo, Bibijagua, etc. The Cañada Sierra, the highest, is 1,653 feet above sea level and 1,335 feet on its base. The base is 1 league (2.7 miles) long in a northwest to southeast direction. It is covered with pines up to the summit, which can be easily ascended on the north side; on the south there are high perpendicular cliffs. The Siguaná, Indios, and

Cisterna rivers rise on this range. It is 5 leagues (13.5 miles) from the town of Nueva Gerona and $2\frac{3}{4}$ (7 miles) from Siguaneya Bay. Daguilla is 1,476 feet above sea level and 1,290 upon its base. Its figure is that of a cone with the base $\frac{1}{2}$ league ($1\frac{1}{2}$ miles) in diameter. The northern part is covered with woods half way to the summit. In these woods may be found the *Lagetta lintearia*. The other parts of this range are covered with pasture lands and its ascent on the south side is very difficult. The Caballos Sierra is 1,074 feet above sea level. The foot of the sierra is 2,400 varas (about $1\frac{1}{2}$ miles) from east to west from the Sierra de Casas River and 50 varas ($11\frac{1}{2}$ feet) above sea level. This range is accessible only on the northwest side and on the southeast, there being perpendicular cliffs almost everywhere, especially on the west. It is entirely covered with woods, and on the east side good timber for ship and house building may be found. The trees which are most abundant on the east are the yayas, guairajes, robles, cedar, sabicues, etc. This sierra runs NNW. and SSE. and in this direction is 3,163 castilian varas ($1=0.914$ U. S. yard) long, occupying a space of $12\frac{1}{2}$ caballerias (416 acres). Marbles of various colors and qualities constitute part of this range. The Casas Sierras are two ranges running from north to south, 1 league, being divided by a level and red stretch of land 350 varas (972 feet) wide. The western part of this valley is rather broken, some creeks being formed which empty into Muertos Creek. The Casas del Sur Sierra is 4,037 castilian varas ($1=0.914$ U. S. yard) from the town of Nueva Gerona. Its base has a length from north to south of 2,534 varas (586 feet) and a width from east to west of 1,192 (311 feet). Its elevation above sea level is 1,035 feet. It is covered with trees of the same kind as are found on the Caballos Sierra. It is inaccessible on the north and northwest, but may easily be ascended on the south and east. On the north it has two cliffs, the sides of which are perpendicular. Between them there is a stretch of land containing about $\frac{1}{2}$ caballeria (17 acres) called "Los Hondones," which is entered by a very narrow neck. This place is naturally inclosed by high cliffs, the trees and vegetation being exuberant. The eastern cliff is 903 feet above sea level and 876 varas (2,433 feet) distant from the principal peak. That of the west is of the same height. The mass of the mountain is clayey, as is the Sierra de Caballos, and on the summit may be found an abundance of loose carbonate of lime. The Casas del Norte Sierra is 924 feet high, rising almost perpendicularly from level ground. It is inaccessible from almost every side. It consists of four peaks running from north to south. The first, on the north, is the lowest, and the height of the others increases progressively. Useful woods can be found at the foot of the mountain and halfway to the summit, but are not as abundant as on the other mountains referred to. At the foot of the mountain, on the southeast, there are in the rainy season some small lakes, formed by the water from the sierras and adjoining plateaus. These lakes dry up after the rainy season is over. Of the other elevations of the island, the only ones worthy of mention are the Sierra Pequeña, south of that of Caballos, with good woods; the Columpo Sierra, consisting of six peaks and masses of blue and white marble, where there was an intention of establishing fortifications, commanding, as it does, the Columpo and Bibijagua lakes, and the Bibijagua Sierra, covered with woods to the summit; to the northwest of the latter is situated the morillo of Bibijagua.

The principal and only navigable rivers of the island are the Santa Fe, Casas, and Nuevas.

MINERAL SPRINGS.

The mineral springs, for which the island has a world-wide reputation, judged from official and individual certification as to

curative properties and results of the waters, are remarkable, especially in pulmonary, rheumatic, and throat affections.

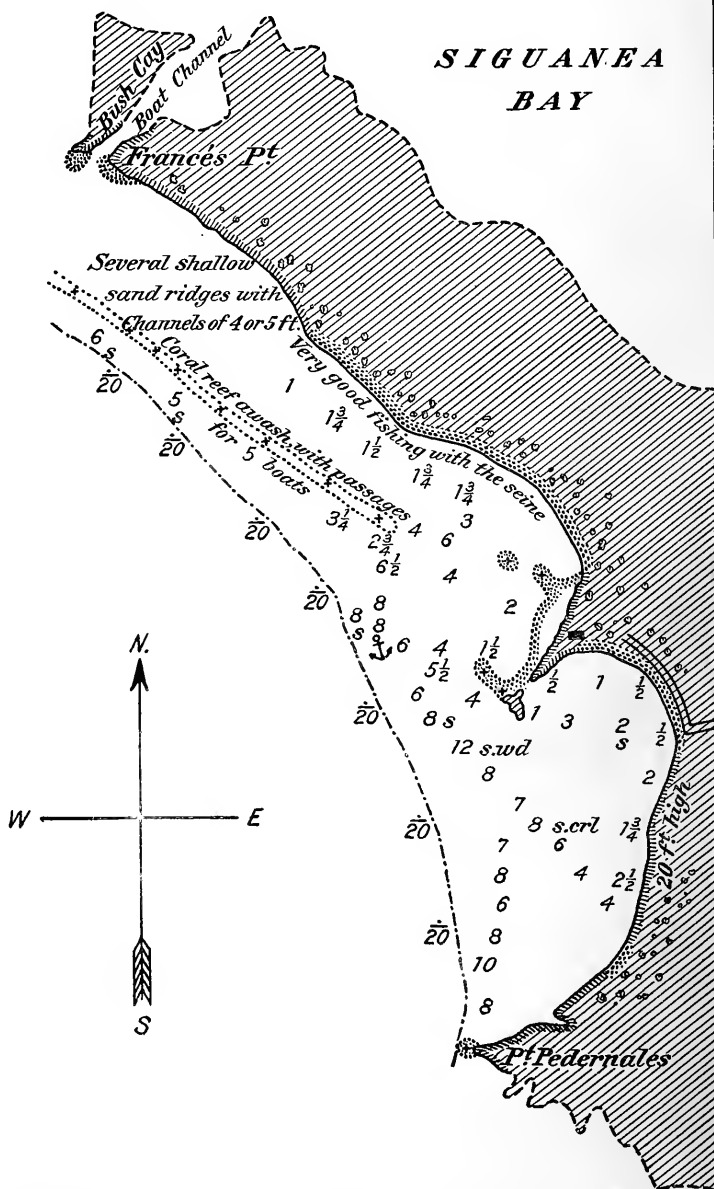
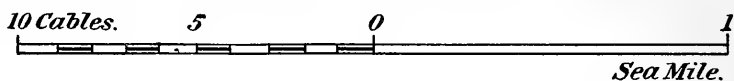
A chemical analysis shows the waters to be impregnated with oxygen and carbonic acid gases, chloride of sodium, sulphate of lime, carbonate of lime, iron, magnesia, chloride of calcium, nitrate of lime, silex, and extractive organic matter. Temperature of water 82° F. The regimen of treatment is two baths of a quarter of an hour each and four glasses, taken inwardly, per day. The baths are erected over the springs. The testimonials of the beneficial effects of bathing and drinking are numerous, among others being a case of bronchial trouble requiring caustic treatment of the throat which was cured in ten days and without a recurrence of the complaint. It is claimed that the waters rival Saratoga in the United States.

CLIMATE.

The climate is described as "delicious, the air pure and balmy and, notwithstanding the island being surrounded by water, is considered dry. The winds coming from the sea and passing over the pine forests are gentle and invigorating." The year is divided into two seasons. During the wet (*lluviosa*), or summer, the rains begin early in June and last until October, seldom more than two hours in the afternoon, and are accompanied by thunder and lightning. The greatest rainfall is in May, June, and July, although there is no month entirely free from rain. During this wet season about two-thirds of the precipitation of the year is received. The day is usually clear until 10 a. m., after which it is showery until night. The nights are clear. The hottest hours are from 10 to 12 a. m. About 2.30 p. m. the breeze (*la virazon*) blowing in from the sea moderates the temperature. At night the copious dews contribute to the luxuriance of vegetation.

The dry season (*seca*), or winter, extends from October to June, with occasional visitations from November to February of *los nortes* (cold winds blowing from the north) lasting about forty-eight hours, when the temperature falls to 50, but is not as uncomfortable as the March winds in the States. This season is not entirely without precipitation, the days of rain numbering about one-third of the wet season. The annual rainfall ranges from 50 to 52 inches, or less than on the Gulf Coast of the States. The average rainy days is 10 in the month, and the average humidity for the year 75 per cent.

The annual temperature of Habana, less than 90 miles in a straight line north, is, mean maximum 82½° to 84° F., mean minimum 71°. The highest temperature on record is 100.6° and lowest 49.6°. The mean annual temperature is 75°. The heat is oppressive on account of the moisture. The prevailing winds of the Isle



ISLE OF PINES—PUERTO FRANCÉS.

Anchorage (approx.): Latitude $21^{\circ} 34' 30''$ N., longitude $83^{\circ} 11' 11''$ W. Soundings in fathoms.

of Pines are the northeast trades, which blow with but little variation throughout the year, rendering the nights cool both in winter and summer.

The range of temperature between summer and winter rarely exceeds a mean of 11° .

Hurricanes are less frequent than in Cuba. In March, April, or May slight earthquakes are sometimes felt. The most damaging hurricanes occurred in 1774, 1844, 1846, 1865, 1870, 1876, 1885, and 1894, and earthquakes, especially in the eastern portion of the mainland, principally in Santiago de Cuba, in 1776, 1842, and 1852.

The "Derrotero de las Antillas," referring to the climatic conditions, says:

The climate of Pinos is among the healthiest known. No yellow fever, nor cholera, which in former years decimated the population of Cuba, ever made its appearance here. Although south of Cuba, its temperature is lower on account of the winds which are always blowing. From all parts, from Cuba as well as from the United States, the sick come to be cured by the pure air and beneficial waters of its springs and creeks.

BAYS AND HARBORS.

Cape Frances, at the extreme point of a rocky crescent-shaped peninsula extending into the ocean, forms the spacious bay and anchorage of Sigüanea on the southwest. A small key connected with the point is the home of numbers of enormous crocodiles (*rhombifer*. *Bibron*) known under the Cuban name "caiman." On the shores of the point are found great quantities of rare and beautiful shells and coral.

From this anchorage vessels drawing 20 feet can pass northward around the island as far as Nueva Gerona inside the keys that lie some 6 miles off the coast. From Frances to Indian Point to the northeast it is 16 miles and trends inland 18 miles. The bay has a depth from $1\frac{3}{4}$ fathoms ($10\frac{1}{2}$ feet) to $5\frac{1}{2}$ fathoms (33 feet). The ship channel referred to is entirely protected from the seaward side of the Indian keys.

Estero del Pino is an indentation in the extreme projection about the center of the western coast of the Isle of Pines, and is fed by a small stream which rises in the vicinity of San Jose, a village on the western slope of the sierra of the same name, and at the terminus of the trail extending from Nueva Gerona west to Santa Teresa and Las Nuevas, thence SSW. to San Jose. From this point a road is projected along the western and southwestern base of Sierra de San Jose to Cañada, in the sierra of that name, an important road center in the southwestern part of the island.

The land in this vicinity conforms to the general topography of the country and has patches of soil suitable to the cultivation of the staples of the island.

The estuary has two mouths, that on the north 1 foot deep and 111 feet wide, the other, on the south, 3 feet deep and about 140 yards wide. In the vicinity, along the shore, are salt swamps and lakes.

On the southern coast, which is rocky and dangerous, is the small harbor of Carapachivey, on a pathway on rocky ledges.

On the northwest coast is the small shallow bay of Barcos, and on the southeast coast the small bay of Cienaga. (See Topography.)

The only two landings—Nueva Gerona, on the Rio Sierra de Casas, and Jucaro, on the Rio Santa Fe—are accessible to vessels drawing 5 feet of water, owing to the shallowness of the bars at the river mouth.

The directions referring to the anchorage of Puerto Frances are intended for sailing vessels and based upon the idea that such vessels may have to get under way suddenly with an unfavorable wind. For other vessels a better anchorage is found in the bight north of Point Pedernales, with that point bearing S. 3° W. true and in from 5 to 9 fathoms of water. This anchorage has been repeatedly occupied by United States vessels and found very satisfactory, the holding ground being found good all over this part of the bight.

Carapachivey Cove, on the south coast, approximate position latitude $21^{\circ} 26' 45''$ N., longitude $82^{\circ} 55' 39''$ W., is of considerable size, affording a safe and commodious anchorage well sheltered to the northward between west-northwest and east-southeast and offering a convenient refuge for vessels of any size from northerly gales. The bottom is of hard coral and holding ground is not good enough for strong onshore winds. The soundings range from 3 to 8 feet near the shore, 10 to 30 feet in the center, and from 30 to 75 feet at the entrance to the cove.

The cove may be found by bringing the middle and largest of three prominent peaks in the interior of the Isle of Pines to bear about N. $8^{\circ} 30'$ E. true and standing in on this bearing. It may further be recognized by a large and conspicuous Cuban house on the northwestern side of the cove. This house is surrounded by cocoanut trees, and near it are five other cocoanut trees in a row.

A good anchorage may be found with the Cuban house on the northwest side of the cove bearing about N. 17° W. true, and the eastern point of the cove S. 53° E. true.

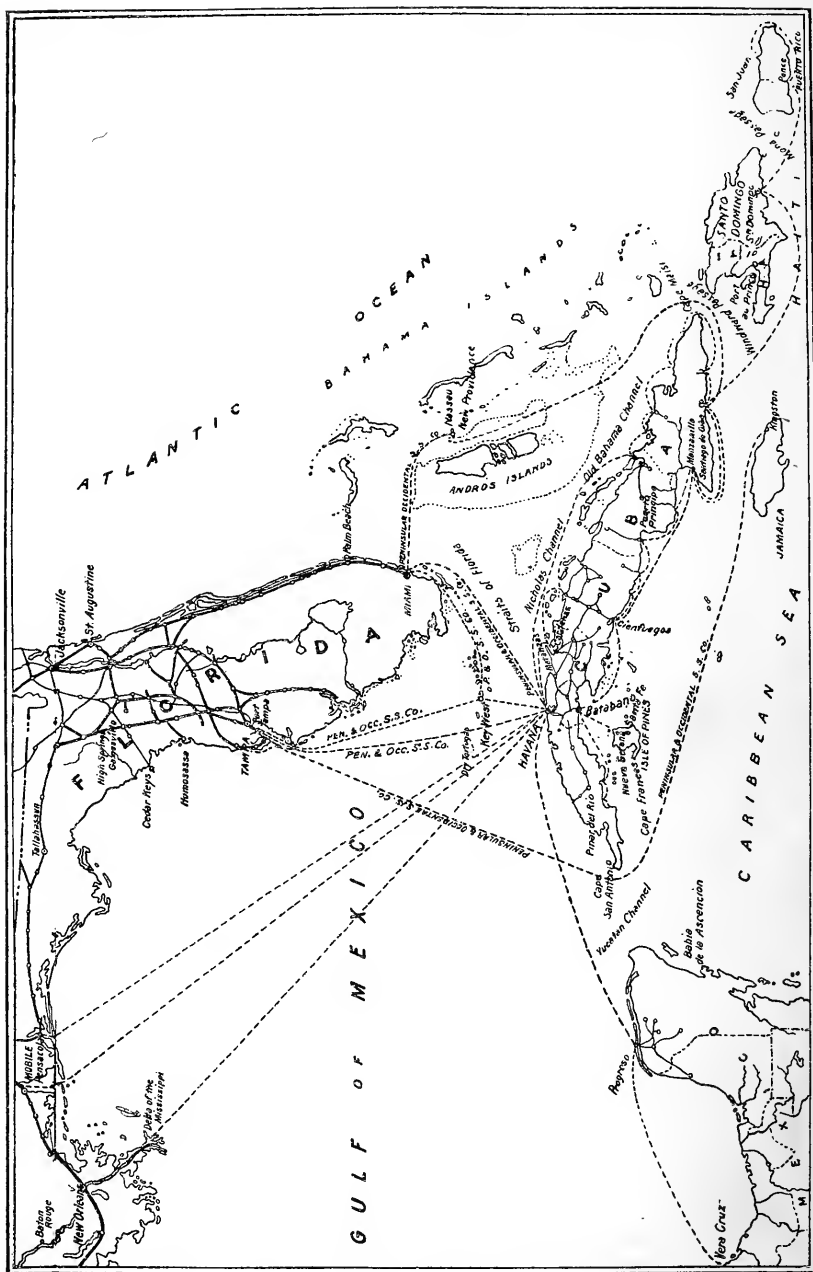
In the northeastern part of the cove is a small anchorage, marked by stakes, where fishing vessels find good shelter in 8 feet of water.

The tides are reported to have a range of from 2 to $2\frac{1}{2}$ feet.

No supplies of water can be had here.

About 3 miles to the eastward of Carapachivey is another cove closed by a chain of rocks, visible some distance offshore.





Steamer routes from United States railway terminal points and connections for Isle of Pines.

A recent hydrographic examination shows that the line of reefs which extends along the whole southern border of the Jardines and Jardinillos makes a pronounced dip to the southward. In this longitude the reef is from 2 to 3 miles farther off the cays than is indicated on existing charts. The cays are themselves about 3 miles farther south than charted.

The reef, as it recedes on either side of this section, has rather more water and breaks less conspicuously, so that a vessel standing in from the southward upon this most advanced point of the reef, or observing it from that side, seems to have to do with an isolated reef.

A large number of lines of soundings were run over an area some 10 miles square extending east, west, and south of this point. There is no other shoal in the vicinity.

The bank all along this part of the reef lies from $\frac{1}{2}$ to $\frac{3}{4}$ mile off the breakers, soundings beginning in 15 and 17 fathoms at the edge of the bank. The breakers can be plainly seen at a distance of several miles.

COMMUNICATIONS.

The United States railroad systems having terminals at south Atlantic and Gulf ports are in touch with the island via Habana as follows:

Pennsylvania Railroad and southern connections via Tampa or Miami to Habana.

Louisville and Nashville Railroad and steamers from Pensacola, also from New Orleans, and steamship line to Habana.

From Habana south by railway, 25 miles, to Batabano, two hours; thence to Santa Fe and Nueva Gerona by weekly steamer. The entire trip consumes about ten hours. Also weekly connections with other points on the south coast.

Joint rates, concurred in by all the lines interested, are as follows:

From New York or Philadelphia, Pa., Pennsylvania Railroad to Washington and via southern connections, Washington Southern Railway and Richmond, Fredericksburg and Potomac Railroad to Richmond; Atlantic Coast Line to Charleston and Plant System to Port Tampa, or Plant System to Jacksonville, and Florida East Coast Railway to Miami; Port Tampa or Miami via Peninsular and Occidental Steamship Company (single rate), \$54.50.

From Habana, Cuba, to Batabano by railroad, thence to Nueva Gerona, Isle of Pines, by steamer, \$10.50 (gold); the rate from Washington to Habana, \$54.50.

The Louisville and Nashville System affords through rail connections from Cincinnati, Louisville, or St. Louis to Pensacola,

connecting with the Louisville and Nashville Steamship Company at Pensacola, Fla., or the steamship line from New Orleans, La., to Habana, Cuba, thence to Nueva Gerona via Batabano.

TABLE OF DISTANCES.

NUEVA GERONA, ISLE OF PINES, TO POINTS ON THE MAINLAND OF THE UNITED STATES.

From Nueva Gerona to—

	Miles.
Batabano, Cuba, water	54
Habana via Batabano, water, 54 miles, rail, 36 miles	90

From Habana (Distance from Habana to points named in United States add 90 miles distance from Nueva Gerona to Habana via Batabano).

	United States. Distance via Port Tampa.		United States. Distance via New York.		Cuba. Distance by—		Remarks.
	Rail.	Water.	Rail.	Water.	Rail.	Water.	
To—							
Atlanta, Ga.	603	337					
Augusta, Me.			388	1,350			
Baltimore, Md.	1,056	337	188	1,350			
Batabano, Cuba.					36		
Boston, Mass.	1,474	337	217	1,350			
Buffalo, N. Y.			411	1,350			
Charleston, S. C.* ..	504	337	739	1,350		738	*738 miles direct by water.
Chattanooga, Tenn. ..	741	337	847	1,350			
Chicago, Ill.	1,334	337	912	1,350			
Cincinnati, Ohio	1,079	*337	757	1,350			*Via Atlanta, Ga.
Cleveland, Ohio	1,323	337	584	1,350			
Denver, Colo.	2,120	*337	1,937	1,350			*Via Atlanta, Ga.
Des Moines, Iowa	1,539	*337	1,268	1,350			*Via Atlanta, Ga.
Detroit, Mich.	1,340	337	662	1,350			*Via Atlanta, Ga.
Dyea, Alaska	3,571	*1,456	3,149	2,469			*Via Chicago, Ill., and Seattle, Wash.
Indianapolis, Ind.	1,160	*337	825	1,350			*Via Jacksonville, Fla.
Jacksonville, Fla.	249	337	995	1,350			
Key West, Fla.						87	
Manila, P. I.*			3,229	8,648			*Via Nagasaki, Japan.
Memphis, Tenn.	*1,021	337	1,157	1,350			*Via Atlanta, Ga.
Miami, Fla.						240	
Milwaukee, Wis.	*1,419	337	997	1,350			*Via Jacksonville, Fla.
Nashville, Tenn.	892	337	998	1,350			*Via Jacksonville, Fla.
New York, N. Y.*	1,244	*337		1,350			*Via Jacksonville, Fla.
Ogden, Utah.	2,653	*337	2,435	1,350			*Via Jacksonville, Fla.
Omaha, Nebr.*	1,623	337	1,405	1,350			*Via Jacksonville, Fla.
Philadelphia, Pa.	1,153	*337	91	1,350			*Via Jacksonville, Fla.
Port Tampa, Fla.						337	
Portland, Oreg.	*3,442	337	3,224	1,350			*Via Jacksonville, Fla.
Richmond, Va.	886	337	343	1,350			
San Antonio, Tex.	1,442	337	1,918	1,350			
San Francisco, Cal.	3,352	337	3,229	1,350			
Savannah, Ga.	389	*337	840	1,350			*705 miles direct by water.
St. Louis, Mo.	1,210	337	1,065	1,350			
St. Paul, Minn.	1,744	337	1,322	1,350			
Washington, D. C.	1,016	337	228	1,350			
Wilmington, Del.	1,126	337	118	1,350			

The cienaga in the south is inaccessible except by footpath on the land side and by sail from Nueva Gerona.

CABLE, TELEGRAPH, AND TELEPHONE.

The nearest cable and telegraph station in communication with the United States is Batabano, 65 miles on the mainland of Cuba, reached by steamer. A telephone line connects Nueva Gerona and Santa Fe with a projected extension to Jucaro.

ROADS AND TRAILS.

Several roads or trails extend to all parts of the island, beginning at Nueva Gerona; one south to Santa Fe, and thence continuing across the eastern end of Cienaga Lagoon, communicates with the south coast at Punta Brava. Another from Nueva Gerona and still another from Santa Fe unite and terminate on the north-eastern shore of Sigüanea Bay. From these main lines branch roads or trails extend to the villages of the interior.

The Sierra de los Cristales, or Crystal Hill, an elevated summit about the center of the island 12 miles from Santa Fe, is reached over a good road through a wild but picturesque country alternating between beautiful meadows and pine forests. The sides of the hill are barren and rocky and without vegetation. From its summit may be seen Nueva Gerona to the north, the Sierras Daquilla and de la Cañada screening the great swamps on the east and west, and over intervening hills and valleys the blue ocean stretching toward the Spanish Main of old.

POPULATION AND TOWNS.

The inhabitants of the island are Spanish and colored, and exhibit in their intercourse with strangers a dignified and kindly spirit. For many years the Isle of Pines was a penal colony for Cuban revolutionists. The language is Spanish.

There are 114 city properties on record, valued at \$22,800.

The island has two towns and one port.

NUEVA GERONA (New Gerona).—This town, the capital and second town in size, lies on the left bank of the Sierra de las Casas River, 2 miles above its mouth on the north coast. It is advantageously situated on a picturesque plateau, between the Caballos and Casas mountains at the base of the latter, about 30 feet above the sea and the swamps at the mouth of the river. It is well drained and, exposed to the constant breezes from the sea, free from malarial influence. Its water comes from a magnesian spring, said to be very beneficial in cases of stomach trouble, and baths have been built into which water from the same spring is conducted. The town has an American hotel, an ice plant, and telephone connection with Santa Fe and a projected extension to Jucaro.

Just outside of the town, on an open plateau, are the barracks, a large stone building with interior courts, capable of accommodating comfortably 200 American troops, and of affording shelter, if necessary, to double that number.

There is a wharf at the town at which the steamer from Batabano lands once a week; also a church. Population 1,000. In the taking of the American census of 1899 it was an important center of enumeration. It also is an American post office.

SANTA FE.—On both banks of the river of the same name, 15 miles SSE. of Nueva Gerona, of which it is officially a suburb (barrio), and has an American post office. There are some fine drives and walks in the vicinity. The country is somewhat flat in the neighborhood and more rolling inland. The port of the town, Jucaro, is about 7 miles distant. Santa Fe is a place of 1,050 inhabitants, two hotels, a church, thermal baths of about blood temperature, medicinal springs of magnesia and iron, favorably known and patronized from Habana in the summer. A consulting surgeon, under Spanish jurisdiction, resided here for the benefit of invalids.

In the United States census enumeration of the inhabitants in 1899 this town was an important subdivision.

JUCARO, the port of Santa Fe, on the river of that name, at a distance of 7 miles, is connected by a fine road. A steamer touches here once a week. The means of communication with Santa Fe is by the volante or ox cart.

TOWNS, VILLAGES, AND HACIENDAS.

In addition to these three important centers are twenty-six villages or haciendas scattered throughout the island, as follows:

ACOSTA.—A fishing village on the peninsula of Port Frances, near the west shore of Sigüanea Bay, in the extreme southwest.

ALMACIJOS.—A village at the headwaters of the western tributary of the Santa Fe River west by south and a few miles above the town of that name.

ASCIENTO DE SANTA FE.—A hamlet on a road southeast of the town and on the right bank of the river of that name. Thermal springs which line the bank of the stream are also found in this vicinity.

CALETA GRANDE.—A hamlet on the Caribbean Sea or the southwest shore of the Puerto Frances Peninsula. It was a subdivision of the census enumeration district of 1899.

CAÑADA.—A village at the base of the sierra of that name on the main road to Rosario and Nueva Gerona in the west part of the island.

CARAPACHIVEY.—An isolated fishing village about the center of the salt lagoon on the south, reached from the highland by the rocky ledges which rise above the soft surrounding surface.

CARBONERAS.—A subdivision of the census enumeration district of 1899.

CAUDAL.—A fishing village in the eastern part of the salt lagoon on the south, on the pathway from the highland to Punta Brava on the south coast.

CUCHILLA ALTA.—A subdivision of the census enumeration district of 1899.

JOROBADO.—A fishing village in the salt marsh near the inlet of the same name on the south coast.

JUCARO.—See "Population and towns."

HOSPITAL.—A hamlet in the sierra foothills about the center of the island between the Santiago and Jagua rivers.

LACUNAGUA.—A village at the forks of the Santa Fe and San Pedro road in the south central part of the highlands.

LAS NUEVAS.—A village in the extreme northwest, near the coast, on the road midway between Nueva Gerona and San José.

NUEVA GERONA.—See "Population and towns."

LLEVAT.—A fishing village near Cape Frances on the peninsula of that name on the west shore of Siguanea Bay in the southwest.

PALMA ALTA.—A fishing village on the pathway across the eastern part of the Cienaga between Caudal and Punta Brava on the south coast.

ROSARIO.—An important road center in the northwestern part near the right bank of the River del Callejon.

SAN JOSE.—On the west coast road near the head of a small stream entering the Estuary del Pino. It is surrounded by a fertile country.

SAN JUAN.—At the headwaters of a stream of the same name at the terminus of a road southeast from Santa Fe near the coast.

SAN PEDRO.—On the stream of that name. It is an important road center in the southwest part of the island leading to the landing at Casimbas on the east shore of Siguanea Bay.

SAN ANTONIO.—On the right bank of the Rio de los Indios near its mouth on the north coast.

SAN FRANCISCO DE LAS PIEDRAS.—About the center of the island at the junction of four roads from Nueva Gerona (north), Santa Fe (east by south), Lacunagua (south), Cañada (southwest), and Las Nuevas (northwest).

SANTA FE.—See "Population and towns."

SANTA RITA DE LA JAGUA.—On the borders of the Cienaga at the forks of the main Punta Brava road, across the salt lagoon to Santa Fe (northeast) and San Pedro (west).

SANTA ROSALIA.—In the north central part, on the road between Santa Fe and Nueva Gerona, nearer the latter point.

SANTA TERESA.—In the northwest, on the road from Nueva Gerona to Las Nuevas, about a mile east of the latter.

SEIBA.—About the center of the island, at the base of the sierra of that name, near the junction of the San Francisco de las Piedras and Lacunagua roads to Santa Fe.

SIERRA DE CABALLOS.—A hamlet in the hills of that name in the extreme northeast, and a subdivision in the census enumeration district of the island.

SIERRA DE CASAS.—A hamlet in the north at the junction of the San Francisco de las Piedras and Las Nuevas roads to San Gerona and a subdivision in the census enumeration district of 1899.

CENSUS.

The report of the census of Cuba, 1899, War Department, office Director Census of Cuba, gives the following results with respect to the Isle of Pines, a municipal district of the Province of Habana:

Total Spanish enumeration December 31, 1887.....	2,040
Total United States enumeration, 1899.....	3,199
Total gain 12 years.....	1,159
By wards and by cities, 1899, Isle of Pines district:	
Calete Grande.....	315
Santa Fe.....	1,050
Remainder of district.....	1,834
Total.....	3,199
Rural population with area and density by municipal districts:	
Rural population.....	3,199
Area in square miles (986 square miles, Div. I. A., 1902).....	840
Density per square mile (3.24, Div. I. A., 1902).....	3.8
Sex, general, nativity and color, all classes:	
Male.....	1,782
Female.....	1,417
Total.....	3,199
Native white:	
Male.....	1,309
Female.....	1,171
Total.....	2,480
Foreign white:	
Male.....	185
Female.....	13
Total.....	198
Percentage of population by sex, general nativity, and color:	
Sex—	
Male.....	55.7
Female.....	44.3
Nativity and color—	
Native whites.....	77.5
Foreign whites.....	6.2
Colored.....	16.3

Age and sex:

Under 5 years—	
Male	195
Female	158
5 to 17 years—	
Male	547
Female	528
18 to 20 years—	
Male	106
Female	97
21 to 44 years—	
Male	671
Female	473
45 years and over—	
Male	263
Female	161
Total	<u>3,199</u>

Birthplace:

Cuba	2,990
Spain	195
Other countries	14
Total	<u>3,199</u>

Citizenship:

Cuban	2,818
Spanish	32
In suspense	334
Other citizenship	15
Total	<u>3,199</u>

Males 21 years of age and over, according to citizenship, literacy, and education:

Whites born in Cuba—

Cuban citizenship—

Can neither read nor write	316
Can read but not write	2
Can read and write	283
With superior education	13

Spanish citizenship, can read and write

2

Citizenship in suspense, can read and write

1

Total

617

Whites born in Spain—

Spanish citizenship—

Can neither read nor write	1
Can read and write	6
With superior education	1

Citizenship in suspense—

Can neither read nor write	47
Can read but not write	2
Can read and write	103
With superior education	4

Total

164

Males 21 years of age and over, according to citizenship, etc.—Continued.

Whites born in other countries—

Foreign and unknown citizenship—

Can neither read nor write	2
Can read and write	1

Total 3

Colored—

Can neither read nor write	110
Can read but can not write	2
Can read and write	33
Foreign and unknown citizenship, can neither read nor write	5

Total 150

Conjugal condition:

Single	2, 184
Married	774
Living together as husband and wife by mutual consent	56
Widowed	184
Unknown	1

Total 3, 199

School attendance, literary and superior education:

Under 10 years of age—

Attended school	38
Did not attend school	784

Ten years of age and over—

Attended school	37
Can neither read nor write	1, 343
Can read but can not write	42
Can read and write	954
Not stated	1

Superior education—

Yes	22
No	3, 177

Total 3, 199

OCCUPATIONS, CENSUS OF 1899.

	Total population.	Agriculture, fisheries, and mining.	Trade and transportation.	Manufacture and mechanical industries.	Professional service.	Domestic and personal service.	Without gainful occupation.
Total	3, 199	403	140	84	9	647	1, 916
Males	1, 782	403	138	84	7	614	536
Females	1, 417		2		2	33	1, 380
Native white	2, 480	255	78	57	6	468	1, 616
Males	1, 309	255	77	57	5	464	451
Females	1, 171		1		1	4	1, 165
Foreign white	198	52	49	12	3	61	21
Males	185	52	48	12	2	60	11
Females	13		1		1	1	10
Colored	521	96	13	15		118	279
Males	288	96	13	15		90	74
Females	233					28	205

Number and size of families:

Total population	3,199
Total number of families	572
Average size, 5.6 persons to a family; of 1 person, 34; 2, 53; 3, 84; 4, 82; 5, 77; 6, 64; 7, 39; 8, 39; 9, 36; 10, 25; 11 to 15, 30; 16 to 20, 6; 21 and over, 3.	

Dwellings and families:

Unoccupied buildings	48
Occuried dwellings	546
Number of families	572
Persons to a family	5.6
Persons to a dwelling	5.9
Families to a dwelling	1

Disposition of excreta:

Occupied dwellings	546
Cesspool	211
Sewer	4
None	319
Not stated	11

Agriculture:

Farm areas, in caballerias (33½ U. S. acres = 1 caballeria).	
Number of farms	94
Total area	7,030.96
Area in cultivation, 1899	25.69
Area cultivated in 1895	14.72
Large timber	1,233.31
Small timber	93.06

DEPENDENT ISLANDS.

The eastern, northern, and western shores of the island are surrounded by a number of keys, through which the mainland may be approached by means of intricate passages only known to the local pilots. Although the waters off the Cienaga on the south are clear of these coral and sand formations, the Cienaga itself is an impassable barrier except by a single causeway to access from that direction.

PIEDRAS, CAYO DE.—A key separating the Cienagas (Salt lagoons) on the east and west and the line of the causeway between the highland and Punta Brava.

AGRICULTURAL RESOURCES.

Of the land lying north of the Cienaga, the swamp and low ground with mangroves is estimated at 25 per cent; the savannas covered with these mangroves and scrub palmetto at 25 per cent; land of doubtful agricultural value, 10 per cent; rich land, 10 per cent; mountains and steep hills, 5 per cent; pine lands unsuitable for agriculture, 25 per cent.

Of the land denominated rich, a very small percentage is actually under cultivation, but the nature of the growth upon it shows the

value of the soil. Of the entire surface of the island, but 1 per cent is now under cultivation, viz: 117 caballerias, or 3,900 acres (1 caballeria = $33\frac{1}{3}$ U. S. acres), in a total of 14,117 caballerias.

As an example of the wonderful variety of product, a finca or farm of less than 33 acres actual cultivation produces coffee, sugar, chocolate (cocoa), cocoanuts, plantains, bananas, boniatos (sweet potatoes), yuca (cassava), (furnishing laundry starch), malangoes (answering for potatoes), rice, beans, lettuce, tobacco, honey, fowls, pigs, and cattle; also a few pineapples for home use.

The rich arable land of the island is not found in large tracts, but in scattered patches among the hills—suitable for tobacco rather than for sugar plantations.

The demand for consumption in the island is small, and the freight rates to the mainland high, hence the only agricultural product that finds a ready market, and commands cash, is tobacco.

Of this staple the island exported in 1899 about 5,000 bales (of 100 pounds each). In 1900 the product was less, as the workers who had come from Cuba, to escape the war, returned to their old homes, where the reputation of the leaf, if not its actual superiority, gives the laborer who cultivates on shares a larger return for his work. Tobacco from this island sells in Habana at the highest market rates. The cultivation of sugar in 1900 was confined to a single estate.

VEGETABLE PRODUCTS.

In addition to tobacco, the staple of the island, the following vegetable products are raised: Boniato, or sweet potato, which has a particularly fine flavor, and with reduced rates to Cuba, should become a marketable product; cocoa (chocolate), raised only experimentally, but the fruit appears to be fine; cocoanuts yield abundantly, though few trees have been planted. This could easily become an article of export.

Coffee has so far been raised only for experiment, but the quality seems to be fair, and with cultivators who understand the work good results might be obtained. Manga (answering as potato) is grown without irrigation and yields well, fine quality. Rice also grows well without irrigation. Sugar cane at present raised in the island is for home use only; the juice is extracted by a crude wooden mill and boiled down in a large open kettle, making a dark coarse sugar unfit for export. Yuca (used for starch) grows without irrigation and yields well. The Indian corn (maize) also flourishes. About 112 estates on the island are mostly devoted to tobacco raising. Of some products two crops are grown.

The climate tropical and the soil a mixture of rich loam and sand present conditions suitable not only for the cultivation of all

the products of that zone, but in addition to tobacco, coffee, and sugar cane is mentioned rubber.

The mainland of Mexico and Central America, almost in sight, produces some of the best rubber in the world. The conditions of soil and climate on the Isle of Pines being the same, it is claimed, should make rubber production a profitable industry. The growth of gutta-percha, which is generally found in the same zone, would also make a particularly valuable addition to the productive wealth of the island. For the production of gutta-percha Holland, Great Britain, and France have established extensive plantations and nurseries in their tropical possessions.

MINERALS.

The only mineral product of importance is the marble, which is found in the two mountains east and west of New Gerona on the north coast. It was worked extensively about thirty years ago, the ruins of a steam plant for sawing and polishing the slabs showing that much money was put into the enterprise. It is said that for reasons of its own the government looked with disfavor on the enterprise and to discourage it levied a duty upon the sand used in sawing, which was hauled from the shore, a mile from the quarry. This imposition killed the enterprise. About twelve years ago, a few cargoes of marble blocks were gotten out and shipped to Habana to be sawed up and worked there. Since then nothing has been done. The marble is of good quality, ranging from a good white statuary, through various shades of blue-veined stone to marble of a dark gray, also specimens with pinkish coloring. There are in the island no samples of very brilliant polish, but, judging from the crystallization of some of the blocks, good results should be obtainable with proper methods. The rock crystals gathered on the hill of that name are much prized by casual visitors.

The quality of the marble is reported by experts to be suitable for the finest statuary, the color being the purest white. Other varieties of different hues are suitable for ornamentation and art, as they take on an excellent polish. The stone is free from cracks and will furnish slabs of any size, the deposits varying from 5 to 25 feet in thickness. They are also situated to meet all requirements of convenient and economical transportation to points of shipment on the coast.

The old workings have done little but step the surface of a cliff of weather-worn rock. The amount of material in sight is unlimited. The old works have a most advantageous location, where a short haul over a good road leads to an old pier.

A good quality of brick clay is found in the island. At New Gerona are the ruins of an extensive brickyard whence bricks,

flooring tiles, and roofing tiles were formerly shipped to Habana. Silver and iron are also reported.

A salt deposit 1,472 feet long lies near Salinas Point. From this to the third Salinas Point the land forms large clean salt pits, without trees, easy to work, and which increase in width for some distance.

FORESTS.

The flora of the island combines many of the varieties of Florida with the large hard-wood trees of Central America and Mexico, and singularly the pine, a characteristic of the temperate zone, which grows over the greater part of the island.

In the forests of this promising little isle of the Antilles are found extensive groves of the *Oreodoxa regio* (royal palm) and twenty-six other varieties of the same numerous family—the mahogany, lignum-vitæ, coco wood, from which reed instruments are made; cedrela odorata, used in the manufacture of cigar boxes and the lining of cabinet woods, also producing an aromatic oil distilled from its wood; and fustic or logwood, a dyestuff the product of cholophora, known as yellow or Cuba wood or old fustic.

In the swamps on the southern side of the island, accessible only by sea, are found all the mahogany and most of the other valuable woods on the island.

Reclus in his "Universal Geography," Volume XVII, says: "All the large trees of the Mexican coast, so remarkable for their majestic growth, for the beauty of their foliage, the splendor and fragrance of their flowers, reappear on the Cuba seaboard. Over thirty species of palms are here met in association with trees such as the pine, which would seem so characteristic of the temperate zone and which gives its name to the "Pinos" Island, where it is found intermingled with palms and mahogany."

The indigenous trees of the Tropics are found side by side with the wild pine from which the island takes its name.

There are at present two small steam saw mills in the island, one in actual running order. There is a large area of pine forests, but the logs large enough for sawing are found only in small stretches west of the center of the island. The tall pines furnish for exportation railway ties, telegraph poles, poles for the roofs of native Cuban huts and for hanging tobacco during the curing process.

There are no statistics available from which the amount and the quality of the hard woods on the southern part of the island can be estimated.

There appears to have been no very regular trade. While much fine wood exists it is not of sufficient size and in sufficient quantity to warrant the expense of getting it to the water, over the difficult

rocky ground in which it grows. The most accessible localities have already been culled, and it is said that to take out the best timber portable railways will have to be used. After the date of the approval of the estimate for forests, 1900-01, the military governor of Cuba created the office of "inspector of forests for the Isle of Pines."

One of the principal sources of wealth is lumber, eleven forest grants having been made to the year 1900.

FRUITS.

The cultivated and wild fruits are celebrated for their quality and grow abundantly, as follows:

AGUACATE (alligator pear), one of the most popular fruits in the Antilles, pear-shaped, of green or purple, and often weighs as high as 2 pounds. On account of the pulp being firm and marrow-like, it is also known as vegetable marrow or midshipman's butter. A very good oil for soap comes from its seed. The tree is an ever-green about 25 or 30 feet high.

BANANA (platano).—Many varieties of this well-known fruit exist and take the place of bread in all country families, being eaten raw or cooked in many different ways.

CAIMITO.—Some are purple on the outside and others dark green. Inside it has a milky fibrous meat, quite sweet and starchy, and a number of round black seeds. It grows on a tree.

CHIRIMOYA (cherimoyer, or custard apple).—A heart-shaped fruit, quite sweet, with a slightly acid taste and very refreshing. It has a scaly exterior and contains numerous seeds buried in a pulp. It is sometimes known as bullock's heart, on account of its size and shape. It grows on trees about 25 or 30 feet high.

COCOANUT (cocoa).—Fruits in bunches of from 12 to 20 on a tree from 60 to 90 feet high. The nut when fresh contains nearly 1 quart of milk, very much esteemed by the natives as a refreshment. The thick rind or husk surrounding the nut is used in making cordage, matting, brushes, bags, etc. A valuable oil is obtained from the nut which is well known to commerce.

FIGS (higos) of all kinds grow luxuriantly.

GRANADILLA.—A fruit grown on a vine which also bears the passion flower. It is generally as large as a child's head. It is very much liked by the natives, who use it in making refreshments and desserts. The meat is glutinous and contains many small seeds.

GUANABANA.—A large fruit about the size of a muskmelon with many seeds and fibrous meat having a delicate flavor. Used for making refreshments, ices, and preserves. Also eaten in its natural state.

GUAVA.—A black, globose, pulpy fruit with an agreeable acid flavor, used in making jelly, marmalade, etc. It is largely cultivated in tropical countries, there being two varieties, the red or apple-shaped and the white or pear-shaped.

LIMA.—Something like a lime, and has the flavor of the grape.

LIME (limon) or citrus, resembling a lemon, but smaller; the product of the *citrus limetta* tree. The juice is used in cooling beverages in the Tropics, and is especially in demand in summer in higher latitudes. It is also boiled and used in fevers.

MAMMEE-SAPOTA.—A tree that yields a fruit the juice of which resembles marmalade. It is known locally as the “mamey Colorado.”

MAMONCILLO grows in clusters; it is a species of plum, tart, and has one fibrous pit.

MANGO.—A fruit shaped somewhat like a pear, but attached to the tree by the larger end. The meat is fibrous and clings to the seed the same as happens with a clingstone peach. It is generally eaten in its natural state, but when green is sometimes boiled as a vegetable. Its flavor, when ripe, is a combination of apricot and pineapple. There are several varieties of this fruit. The tree is 30 or 35 feet high.

MARANON.—Similar to a persimmon, heart-shaped, and has a heart-shaped seed on the outside which is roasted and eaten as a chestnut.

ORANGES.—This fruit of commerce in fine varieties grows abundantly, both cultivated and wild.

PAPAYA (paw-paw).—About 10 inches long, commonly of an oblong form, ribbed, and having a thick fleshy rind. It is eaten raw, or when green is boiled as a vegetable and is also pickled. The tree is about 20 feet high and has large leaves. Meat boiled with a small portion of the leaf is made tender, or this can be done by simply hanging the meat among the leaves. The seeds are used as a vermifuge.

PINEAPPLE (pina).—Several varieties of this fruit grow in the island, and with proper cultivation may be a valuable product.

SAPODILLO (plum).—Small brown fruit with a black seed like a watermelon, and juice which disappears with incipient decay, when the fruit becomes very sugary.

INDUSTRIES.

The mechanical industries are tobacco manufacturing, quarrying, weaving for home consumption, cutting and sawing lumber and working into poles and railroad ties, and charcoal burning; also forest products, turpentine, pitch, and tar. Recent returns give 54 industrial and commercial establishments.

Other industries are fishing, the shallow adjacent waters abounding in fine marketable fish, lobsters, and turtles.

The raising of horses, which are small but hardy and good roadsters, and cattle, much depleted as to numbers at the outbreak of the war, is an important occupation, the valleys and hillsides being covered with nutritious grasses. Pigs are also raised in large numbers, the wild fruits and seeds furnishing abundant food. At the close of 1899 there were 4,164 horned cattle, 1,231 horses, 144 mules, and 3,396 hogs and goats.

Among the various American enterprises may be mentioned a new hotel; an ice plant; a dentist's office; a grocery establishment; blacksmithshop; turpentine plant; and orange-growing and truck-gardening for United States markets. Prospectors interested in other occupations are also looking over the ground.

FAUNA.

There are no wild animals which might be classed as game on the land. The iguana furnishes some fine specimens. The species of reptiles are few and none of them venomous.

Bird life is chiefly represented by the parrot. There are 200 varieties of all species. The surrounding waters teem with fish, the red snapper being one of the best; 700 varieties known to science.

The manati, or sea cow, abounds in the waters along the coast.

COMMERCE.

The exports are tobacco, charcoal, lumber, poles, railway ties, tortoise shells, fruits, and parrots, which exist in large numbers.

The nearest port of entry under the customs system of Cuba is Batabano. That town, on the south coast of Habana province, has a safe port, well sheltered.

The statistics of exports and imports of the Isle of Pines are not given separately, but are included in the general tables of the entry district.

COINAGE, WEIGHTS AND MEASURES.

The value of foreign coins, as expressed in the money of account of the United States, is based on the pure metal of such coin of standard value. The standard of the Isle of Pines, taken from the Island of Cuba, is gold and silver, and the monetary unit the peso.

Coins:

Doubloon	Dollars, U. S..	5.017
Peso (silver)	do	0.600
Peso (gold)	do	0.926

Weights:

Arroba	Pounds, U. S..	25.3664
Libra	do	1.0161
Quintal	do	101.6100

Measures:

Dry—

Fanaga	Bushels, U. S..	1.599
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Liquid—

Arroba	Gallons, U. S..	4.263
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Linear—

Cuerda, $8\frac{1}{2}$ varas	Feet, U. S..	$23\frac{1}{2}$
Legua	Stat. miles, U. S..	$2.672\frac{1}{2}$
Vara	Inches, U. S..	33.384

Square—

Caballeria	Cordels..	576
Caballeria	Acres, U. S..	$33\frac{1}{2}$
Cordel	Sq. yards, U. S..	495.40
Legua	Acres..	4.633

Cubic—

Cuerda (cord)	Feet, U. S..	128
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CIVIL GOVERNMENT.

The island was discovered by Columbus in 1494, who named it "La Evangelista." In the administration of Cuba it became a dependency of Habana, of which province it is a municipality (district).

It constitutes an ayuntamiento or municipal district of the judicial district of Bejucal, province of Habana, instituted in 1880, with its seat at Nueva Gerona. It was reorganized in July, 1899, under United States military control.

The ayuntamiento owns two city properties, a bathing establishment, $8\frac{1}{2}$ caballerias (283 acres) of land formerly held by the government, and the cemetery of Nueva Gerona, the value of which is estimated at \$8,353.

In June, 1900, there were eight schools with 155 scholars on the island.

POLITICAL STATUS.

The definition of the status of the Isle of Pines in adjustment of the relations between the United States and Cuba is contained in that portion of the act making appropriation for the support of the Army for the fiscal year ending June 30, 1902; approved March 2, 1901 (U. S. Stats. L., 56th Cong., 1899-1901, vol. 31, pp. 897-8), which provided that "in the fulfillment of the declaration contained in the joint resolution of Congress April 20, 1898, for the recognition of the independence of the people of Cuba, leaving the government and control of the island to its people," no action shall be taken until "a government shall have been established in said island under a constitution which either as a part thereof or in an ordinance appended thereto shall define the future relations of the

United States with Cuba substantially" under the following heads: I. Conditions of Treaties; II. Public debt; III. Intervention by the United States; IV. Acts of United States during military occupancy ratified; V. Sanitary measures; VI. Isle of Pines to be omitted from the proposed constitutional boundaries of Cuba, the title thereto being left to future adjustment by treaty; VII. Coal-ing stations; VIII. By way of further assurance the foregoing to be made part of a treaty.

HISTORICAL EVENTS.

Among the historical events off the island was the attack by a Spanish fleet of the expedition under the celebrated British Admiral Drake in the sixteenth century returning from Costa Rica. The Englishman, after a desperate encounter against great odds, managed to escape with the loss of one vessel.

This island in the days of the buccaneers was the headquarters of the pirates in their forays upon the islands of the Antilles and the Spanish Main.

PUBLIC LAND, TAXES, AND DUES.

A report by the collector of customs at Batabano to the chief at Habana, February 22, 1899, gives the following particulars on public lands, former taxes, and dues:

The only land belonging to the state is embraced in 63 lots, each about 50 acres, scattered within 3 miles of Nueva Gerona. These lots appear to have been left after the land had been picked over, as they are generally in the worst localities and practically worthless, containing nothing but mangrove scrub, dwarf palmettos, and thin pine grass. A few of the better lots are in use as small farms, the occupants paying, it is alleged, a nominal rent to the hacienda at Habana (no records on this point exist in the island).

No record of dues paid to the Crown for the privilege of exporting timber can be found. It is understood that contributions were arbitrarily levied from time to time by the military governor of the island. These "contributions" or "gratifications" were paid, it is said, to secure immunity from official obstruction in the going and coming of vessels from the inaccessible points at which the lumber was gathered. It is presumable that some of these contributions were used for the benefit of the island, but no record appears of the amount or disposition.

The governor of the island immediately collected dues for the slaughtering of cattle and the selling of meats, and also from stores and shops of all kinds. To meet the difficulty of beef supply at a wood-choppers' camp the governor devised a system of dues based upon the amount of charcoal and cord wood exported, which dues were levied in lieu of those legally authorized.

In accessible camps or "cuttings" the amount of export was actually ascertained; in other "cuttings" more inaccessible a lump sum per month was exacted, based on the number of men employed.

The quantity of mangrove and other scrubby wood available for charcoal and cord wood is practically unlimited, all the coast of the island and the keys to the north being covered with this growth, and the state does not appear to have collected any dues for the privilege of cutting. The dues seem to have been simply in the nature of town taxes, levied on wood-choppers' camps in order that they should not, by leaving the established towns, escape the burden of taxation.

APPENDIX.

PHYSIOGRAPHY OF THE ISLE OF PINES.

[By C. WILLARD HAYES, U. S. Geological Survey.]

The essential elements in the physiography of this island are (1) a low swampy coastal plain, (2) a broad gently undulating interior plain, and (3) ridges and hills rising abruptly from the central plain.

(1) At a few points along the north side of the island the ridges reach the coast, and the waves have produced sea cliffs. Elsewhere about its eastern, northern, and western sides (as well as in a belt crossing the island south of its center and forming the great cienaga) the island is bordered by a narrow strip of lowland, generally swampy, and covered with a dense growth of mangroves. The shore is often formed by a low sandy beach, back of which is the mangrove swamp. This coastal fringe corresponds in all particulars with the many low sandy keys which border the southern coast of Cuba from Cape Cruz westward. It varies in width from a mere fringe only a few yards in width to a strip several miles broad. Wherever it is present it shows that the island is increasing in area.

The southern coast of the island is entirely different from that above described. Facing upon the deep Caribbean Sea, where the waves have full unobstructed sweep, conditions are favorable for coral growth, and this portion of the coast is fringed with coral reefs.

The island has in comparatively recent geologic time stood slightly lower than now. The land now forming the coastal plain was then submerged, and the waves cut a terrace about 50 feet above the present sea level. Nueva Gerona is built on such a terrace, and at various places back of that town the old sea cliff may be observed. It is prominent about the northern ends of both the Sierras de las Casas and los Caballos. It is also seen on the road from Santa Fe to Jucaro, and a further examination would doubtless show its presence at many other points along the northern and eastern sides of the island. It seems, however, to be entirely absent from the southwestern portion.

(2) The interior plain occupies probably 75 per cent of the entire surface of the island. It varies in altitude between 75 and 110 feet, with a few portions possibly rising to 150 feet above sea level. The surface consists of a succession of gentle swells and depressions, barely enough to relieve the monotony of a dead level. The streams, which are not numerous, flow in broad depressions with gentle slopes. In these depressions the channels are cut from 5 to 15 feet in depth, with steep banks, and proportionate to the volume of the streams. No well developed flood plains are encountered and the streams appear to fill these channels in time of flood. All the streams, except near the coast, show rock in place in their channels.

This plain is covered for the most part with fine quartz gravel. The smaller pebbles, from $\frac{1}{8}$ to $\frac{3}{8}$ inch in diameter, are well rounded and often highly polished. The larger pebbles are more angular with increasing size, and those over 2 inches in diameter have their angles scarcely at all rounded. This gravel is everywhere deep red or black, and the iron and manganese which produce the color have not only stained the surface of the pebbles but have penetrated entirely through,

often giving them a metallic luster. In addition to coloring the pebbles, the iron has in many places cemented them into large masses of conglomerate.

So far as observed this interior plain is everywhere underlain by highly crystalline mica schists. The foliation of the schist strikes nearly north and south, and has a vertical or steep easterly dip. Its surface is always deeply weathered except where streams have cut down and exposed the fresh rock in their channels. The weathered rock passes insensibly upward into the subsoil and that into the surface gravels showing that both are residual, that is, derived directly from the underlying rocks. The schist contains numerous quartz veins and stringers, and it is from these that the gravel is derived. The rounding of the quartz fragments is probably due not to the rolling action of waves or stream currents but to the beating of rain. By this means only the smaller fragments, which can be easily moved by the rain, are rounded, while the larger fragments retain their original angular forms.

The soil covering this interior plain varies from barren red gravel to dark-gray sandy loam. The former covers the swells, while the latter is found in the intervening depressions. Sometimes there is a layer of gravel beneath a few inches of sandy loam at the surface, a condition which exercises an important influence on the agricultural value of the land.

Practically the entire surface of the interior plain is occupied by forests and savannahs or prairies. The character of the timber depends on variations in soil. Where the ferruginous gravel is abundant only pines are found. The trees are small, rarely attaining a greater size than 14 or 16 inches in diameter and 16 to 18 feet to the main branches. The best timber is found in the west central portion of the island. In the shallow depressions, where the surface soil is a sandy loam, the pines are largely replaced by palmettos. The character of the forests is shown by the accompanying photographs. They are generally open and quite free from undergrowth of any kind except grass. There is no sharp line between forest and savannah, and the latter often contain scattered pine trees or groups of palmettos.

The first suggestion regarding the origin of this plain is that it is due to marine erosion, but a careful examination fails to reveal any of the characteristic marks of wave action. As stated above, the superficial gravel does not owe its rounded form to the action of waves, and no traces of marine deposits are found on the plain. It has undoubtedly been produced by the long-continued action of subaerial forces, which are everywhere tending to degrade the land surface to sea level. Unlike Cuba, the Isle of Pines has maintained a stable position with reference to sea level for a very long time, long enough for the atmospheric agencies to reduce highlands of hard schist nearly to base level. It has not recently been elevated to any considerable altitude, for its streams are flowing in rock channels—not excavated and alluvial filled channels as would otherwise be the case.

(3) Approaching the Isle of Pines from the northward the first impression one gains is that its surface is prevailingly mountainous. This is due to the presence of numerous ridges and groups of hills, which rise abruptly from the central plain. When examined near at hand they are found to occupy a relatively small proportion of the island's surface, being entirely surrounded and isolated by the central plain. They are true monadnocks; that is, residual masses of resistant rock left in high relief by the wearing down of the less resistant surrounding rocks.

The Sierras de las Casas, los Caballos, and Pequena are three parallel ridges in the northern part of the island, about $2\frac{1}{2}$ or 3 miles apart, and trending nearly due north and south. Nueva Gerona lies about midway between the two first named. The highest points in these ridges are between 1,000 and 1,200 feet.

They are composed of marble in massive beds dipping steeply toward the east. This marble formation is estimated to be at least 2,000 feet in thickness, and the three parallel ridges are probably formed by faulted blocks and contain the same beds. The form of these ridges is determined by the structure. They have smooth though steep slopes on the eastern sides, the slopes generally corresponding with the dip of the marble beds, and extremely rugged, often precipitous, slopes on the western sides where the edges of the beds outcrop. These ridges are almost entirely devoid of soil and sustain only a scanty vegetation, some trees and bushes maintaining a precarious foothold in the crevices of the rocks.

The Cerro de la Daguilla is an elongated cone about 10 miles south of Santa Fe. It is composed of dark-green hornblende schist, evidently an altered igneous rock. It differs completely from the marble monadnocks in the northern part of the island. Its slopes are generally smooth, though very steep, and covered with sufficient soil to sustain a dense growth of bushes and small trees or a thick covering of grass. The Sierras de la Cañada, de San Pedro, del Norte, and de la Seiba, judging from their forms, are probably composed of rocks similar to those in La Daguilla.

The Cerros de la Siguanea and de las Maneaderos are groups of low hills in the southwestern portion of the island near Siguanea Bay. They are composed of schist similar to that underlying the surrounding central plain, except that it is more siliceous, and hence better able to resist atmospheric degradation.

Considering the island in its broader relations, it is evident that it has little in common with Cuba. Its geologic structures appear to have no close connection with those of the larger island, in fact, the strike of its structural axes is nearly at right angles with those of Pinar del Rio, the nearest part of Cuba. No trace of Mesozoic or Tertiary formations, which make up so large a part of Cuba, was observed on the Isle of Pines, though such formations may possibly occur in the southern portion south of the great cienaga. Further, the island appears to have had an extremely simple geologic history, and to have suffered few of the geologic vicissitudes of its northern neighbor.

Considered from the economic view point the Isle of Pines is scarcely to be compared with Cuba. Its soil is not adapted for sugar raising, though certain parts are probably as well adapted to tobacco culture as the famous Vuelta Abajo district. Much of the island would doubtless produce fruits, as well as cacao, which latter is one of the most profitable crops grown in the tropics. The industry for which the island appears preeminently fitted is grazing, and it will doubtless in time become an important source of supply for cattle and sheep for the West Indian markets.

It is also destined to become an important health resort, and all conditions of climate, vegetation, and scenery combine to render it attractive both to invalids and others who wish to escape the severe northern winters.

The mineral resources so far as at present known are confined to marble, but of this there is an unlimited amount of different grades, suitable for a great variety of purposes. It is possible that iron and manganese may both be discovered on the island in commercial quantities.

Unfortunately the island is without deep harbors, which largely neutralizes its value from a military standpoint.

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